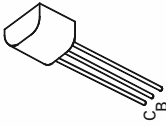


NPN SILICON PLANAR MEDIUM POWER
DARLINGTON TRANSISTORS

ISSUE 1 – MARCH 94

FEATURES

- * 80 Volt V_{CEO}
- * 1 Amp continuous current
- * Gain of 2K at $I_C=1$ Amp
- * $P_{tot}=1$ Watt



E-Line
TO92 Compatible

ABSOLUTE MAXIMUM RATINGS.

PARAMETER	SYMBOL	ZTX602	ZTX603	UNIT
Collector-Base Voltage	V_{CBO}	80	100	V
Collector-Emitter Voltage	V_{CEO}	60	80	V
Emitter-Base Voltage	V_{EBO}	10		V
Peak Pulse Current	I_{CM}	4		A
Continuous Collector Current	I_C	1		A
Power Dissipation at $T_{amb} = 25^{\circ}C$ derate above $25^{\circ}C$	P_{tot}	1 5.7		W mW/ $^{\circ}C$
Operating and Storage Temperature Range	T_j, T_{stg}	-55 to +200		$^{\circ}C$

ELECTRICAL CHARACTERISTICS (at $T_{amb} = 25^{\circ}C$ unless otherwise stated).

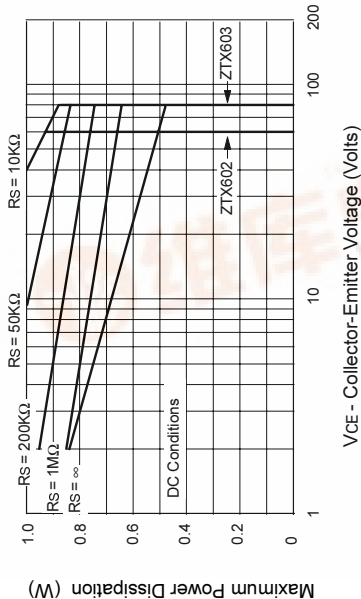
PARAMETER	SYMBOL	ZTX602		ZTX603		UNIT	CONDITIONS.
		MIN.	MAX.	MIN.	MAX.		
Collector-Base Breakdown Voltage	$V_{(BR)CBO}$	80		100		V	$I_C=100\mu A$
Collector-Emitter Breakdown Voltage	$V_{(BR)CEO}$	60		80		V	$I_C=10mA^*$
Emitter-Base Breakdown Voltage	$V_{(BR)EBO}$	10		10		V	$I_E=100\mu A$
Collector Cut-Off Current	I_{CBO}	0.01	10	0.01	10	μA	$V_{CB}=60V$
						μA	$V_{CB}=80V$
						μA	$V_{CB}=60V, T_{amb}=100^{\circ}C$
						μA	$V_{CB}=80V, T_{amb}=100^{\circ}C$
Emitter Cut-Off Current	I_{EBO}	0.1		0.1		μA	$V_{EB}=8V$
						μA	
Collector-Emitter Cut-Off Current	I_{CES}	10		10		μA	$V_{CES}=60V$
						μA	$V_{CES}=80V$
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$	1.0	1.0	1.0	1.0	V	$I_C=400mA,$
						V	$I_B=0.4mA^*,$
Base-Emitter Saturation Voltage	$V_{BE(sat)}$	1.8		1.8		V	$I_C=1A, I_B=1mA^*$
						V	$I_C=1A, I_B=1mA^*$
Base-Emitter Turn-On Voltage	$V_{BE(on)}$	1.7		1.7		V	$I_C=1A, V_{CE}=5V^*$

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ELECTRICAL CHARACTERISTICS (at $T_{amb} = 25^{\circ}C$ unless otherwise stated).

PARAMETER	SYMBOL	ZTX602		ZTX603		UNIT	CONDITIONS.
		MIN.	MAX.	MIN.	MAX.		
Static Forward Current Transfer Ratio	h_{FE}	2K		2K			$I_C=50mA, V_{CE}=5V$
		5K		5K			$I_C=500mA, V_{CE}=5V^*$
		2K	100K	2K	100K		$I_C=1A, V_{CE}=5V^*$
		0.5K		0.5K			$I_C=2A, V_{CE}=5V^*$
Transition Frequency	f_T	150		150		MHz	$I_C=100mA, V_{CE}=10V$ $f=20MHz$
Input Capacitance	C_{ibo}		90 Typical			pF	$V_{EB}=500mV, f=1MHz$
Output Capacitance	C_{obo}		15 Typical			pF	$V_{CB}=10V, f=1MHz$
Switching Times	t_{on}		0.5 Typical			μs	$I_C=500mA, V_{CE}=10V$ $I_B=I_{B2}=0.5mA$
	t_{off}		1.1 Typical			μs	

Measured under pulsed conditions. Pulse width=300 μs . Duty cycle $\leq 2\%$



Voltage Derating Graph

The maximum permissible operational temperature can be obtained from this graph using the following equation

$$T_{amb(max)} = \frac{Power(max) - Power(act)}{0.0057} + 25^{\circ}C$$

$T_{amb(max)}$ = Maximum operating ambient temperature

$Power(max)$ = Maximum power dissipation figure, obtained from the above graph for a given V_{CE} and source resistance (R_S)

$Power(actual)$ = Actual power dissipation in users circuit

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ZTX602
ZTX603

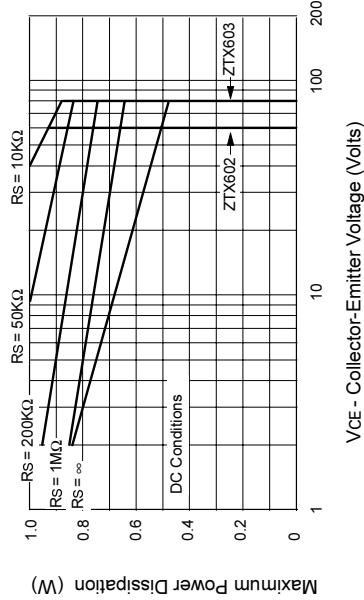
NPN SILICON PLANAR MEDIUM POWER
DARLINGTON TRANSISTORS

ZTX602
ZTX603

ELECTRICAL CHARACTERISTICS (at T_{amb} = 25°C unless otherwise stated).

PARAMETER	SYMBOL	ZTX602		ZTX603		UNIT	CONDITIONS.
		MIN.	MAX.	MIN.	MAX.		
Static Forward Current Transfer Ratio	h _{FE}	2K	100K	2K	100K		I _C =50mA, V _{CE} =5V I _C =500mA, V _{CE} =5V* I _C =1A, V _{CE} =5V* I _C =2A, V _{CE} =5V*
		5K		5K			
		2K		2K			
		0.5K		0.5K			
Transition Frequency	f _T	150		150		MHz	I _C =100mA, V _{CE} =10V f=20MHz
Input Capacitance	C _{ibo}	90 Typical				pF	V _{EB} =500mV, f=1MHz
Output Capacitance	C _{obo}	15 Typical				pF	V _{CE} =10V, f=1MHz
Switching Times	t _{on}	0.5 Typical				μs	I _C =500mA, V _{CE} =10V I _B =I _{B2} =0.5mA
	t _{off}	1.1 Typical				μs	

Measured under pulsed conditions. Pulse width=300μs. Duty cycle ≤2%



Voltage Derating Graph

The maximum permissible operational temperature can be obtained from this graph using the following equation

$$T_{amb(max)} = \frac{Power(max) - Power(act)}{0.0057} + 25^{\circ}C$$

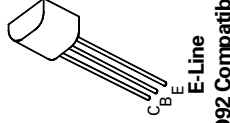
T_{amb(max)}= Maximum operating ambient temperature

Power(max) = Maximum power dissipation figure, obtained from the above graph for a given V_{CE} and source resistance (R_S)

Power(actual)= Actual power dissipation in users circuit

FEATURES

- * 80 Volt V_{CEO}
- * 1 Amp continuous current
- * Gain of 2K at I_C=1 Amp
- * P_{tot}= 1 Watt



ABSOLUTE MAXIMUM RATINGS.

PARAMETER	SYMBOL	ZTX602	ZTX603	UNIT
Collector-Base Voltage	V _{CBO}	80	100	V
Collector-Emitter Voltage	V _{CEO}	60	80	V
Emitter-Base Voltage	V _{EB0}	10		V
Peak Pulse Current	I _{CM}	4		A
Continuous Collector Current	I _C	1		A
Power Dissipation at T _{amb} = 25°C derate above 25°C	P _{tot}	1 5.7		W mW/ °C
Operating and Storage Temperature Range	T _J ; T _{stg}	-55 to +200		°C

ELECTRICAL CHARACTERISTICS (at T_{amb} = 25°C unless otherwise stated).

PARAMETER	SYMBOL	ZTX602		ZTX603		UNIT	CONDITIONS.
		MIN.	MAX.	MIN.	MAX.		
Collector-Base Breakdown Voltage	V _{(BR)CBO}	80		100		V	I _C =100μA
Collector-Emitter Breakdown Voltage	V _{(BR)CEO}	60		80		V	I _C =10mA*
Emitter-Base Breakdown Voltage	V _{(BR)EBO}	10		10		V	I _E =100μA
Collector Cut-Off Current	I _{CBO}	0.01	10	0.01	10	μA	V _{CB} =60V
						μA	V _{CB} =80V
						μA	V _{CB} =60V, T _{amb} =100°C
						μA	V _{CB} =80V, T _{amb} =100°C
Emitter Cut-Off Current	I _{EBO}	0.1		0.1		μA	V _{EB} =8V
Collector-Emitter Cut-Off Current	I _{CES}	10		10		μA	V _{CE} =60V
						μA	V _{CE} =80V
Collector-Emitter Saturation Voltage	V _{CE(sat)}	1.0	1.0	1.0	1.0	V	I _C =400mA,
						V	I _B =0.4mA*
Base-Emitter Saturation Voltage	V _{BE(sat)}	1.8		1.8		V	I _C =1A, I _B =1mA*
						V	I _C =1A, I _B =1mA*
Base-Emitter Turn-On Voltage	V _{BE(on)}	1.7		1.7		V	I _C =1A, V _{CE} =5V*

ZTX602
ZTX603

TYPICAL CHARACTERISTICS

